CLAIMS

1. A core assembly for an ignition coil in an internal combustion engine, the core assembly comprising:

an inner core comprising an I-shaped lamination stack defining a core axis;

an outer core comprising a pair of opposing C-shaped lamination stacks;

the inner core having first and second opposing free ends, the second end defining an extension portion;

each C-shaped lamination stack having a third free end and a fourth free end, each fourth free end having a reduced width portion, the reduced width portions cooperating to define a notch sized to receive the extension portion;

a first joint formed by the first end of the I-shaped lamination stack and the pair of third ends of the pair of C-shaped lamination stacks, the third ends abutting each other and being generally parallel to the core axis, the first end abutting the third ends and being generally perpendicular to the core axis; and

a second joint formed by the second end of the I-shaped lamination stack and the pair of fourth ends of the pair of C-shaped lamination stacks, the extension portion of the second end positioned in the notch and abutting against the reduced width portions of the fourth ends.

2. The core assembly of claim 1, wherein the extension portion has a tapered shape.

3. The core assembly of claim 1, wherein the extension portion has a triangular shape.

4. The core assembly of claim 1, wherein the extension portion has a curved shape.

5. The core assembly of claim 4, wherein the extension portion is semicircular.

6. The core assembly of claim 1, wherein the extension portion and notch extend a distance along the core axis about equal to the width of the outer core.

7. The core assembly of claim 1, wherein the extension portion and notch extend a distance along the core axis less than the width of the outer core.

8. The core assembly of claim 1, wherein the notch extends only a portion of the way through the width of the fourth ends leaving a portion of the fourth end surfaces abutting along a line parallel to the core axis.

9. The core assembly of claim 1, wherein the first end of the I-shaped lamination stack has a magnet engaging the thirds ends of the C-shaped lamination stacks.

10. The core assembly of claim 1, wherein the first end of the I-shaped lamination stack abuts the third ends of the C-shaped lamination stacks along a first joint surface, and wherein the second end of the I-shaped lamination stack abuts the fourth ends of the C-shaped lamination stacks along a second joint surface, the first joint surface being non-parallel to the second joint surface.

11. The core assembly of claim 1, wherein the third ends define a first opening and the fourth ends define a second opening when the C-shaped lamination stacks are positioned apart a distance less than the width of the I-shaped lamination stack, and wherein the first opening is sized to prevent the first end of the I-shaped lamination from entering into the first opening, and wherein the second opening is sized to allow the second end of the I-shaped lamination to enter into the second opening.

12. A core assembly for an ignition coil in an internal combustion engine, the core assembly comprising:

an inner core comprising an I-shaped lamination stack defining a core axis;

an outer core comprising a pair of opposing C-shaped lamination stacks;

the inner core having first and second opposing free ends, the second end being tapered;

each C-shaped lamination stack having a third free end and a fourth free end, each fourth free end being tapered, the fourth free ends cooperating to define a notch sized to receive the tapered second end;

the opposing C-shaped lamination stacks being pulled apart and pushed back together to allow the inner core to be positioned inside the outer core;

the third ends defining a first opening and the fourth ends defining a second opening when the C-shaped lamination stacks are pulled apart a distance less than the width of the I-shaped lamination stack; and

the first opening being sized to prevent the first end of the I-shaped lamination from entering into the first opening, the second opening being sized to allow the second end of the I-shaped lamination to enter into the second opening.

13. The core assembly of claim 12, wherein the tapered fourth ends press against the tapered second end to axially position the I-shaped lamination stack along the core axis.

14. The core assembly of claim 12, further comprising a first joint formed by the first end of the I-shaped lamination stack and the pair of third ends of the pair of C-shaped lamination stacks, the third ends abutting each other and being generally parallel to the core axis, the first end abutting the third ends and being generally perpendicular to the core axis.

15. The core assembly of claim 12, further comprising a second joint formed by the second end of the I-shaped lamination stack and the pair of fourth ends of the pair of C-shaped lamination stacks, the tapered second end positioned in the notch and abutting against the tapered fourth ends.

16. The core assembly of claim 12, wherein the second end of the I-shaped lamination stack has a triangular shape.

17. The core assembly of claim 12, wherein the second end of the I-shaped lamination stack is semicircular in shape.

18. The core assembly of claim 12, wherein the notch extends a distance along the core axis less than the width of the outer core.

19. The core assembly of claim 12, wherein the first end of the I-shaped lamination stack abuts the third ends of the C-shaped lamination stacks along a first joint surface, and wherein the second end of the I-shaped lamination stack abuts the fourth ends of the C-shaped lamination stacks along a second joint surface, the first joint surface being non-parallel to the second joint surface.

20. A core assembly for an ignition coil in an internal combustion engine, the core assembly comprising:

an inner core comprising an I-shaped lamination stack defining a core axis, the inner core having first and second opposing free ends;

an outer core comprising a pair of opposing C-shaped lamination stacks, each C-shaped lamination stack having a third free end and a fourth free end;

a first joint formed by the first end of the I-shaped lamination stack and the pair of third ends of the pair of C-shaped lamination stacks, the third ends abutting each other and being generally parallel to the core axis, the first end abutting the third ends and being generally perpendicular to the core axis; and

a second joint formed by the second end of the I-shaped lamination stack and the pair of fourth ends of the pair of C-shaped lamination stacks, the fourth ends abutting each other and being generally parallel to the core axis, the second end abutting the fourth ends and being generally perpendicular to the core axis.